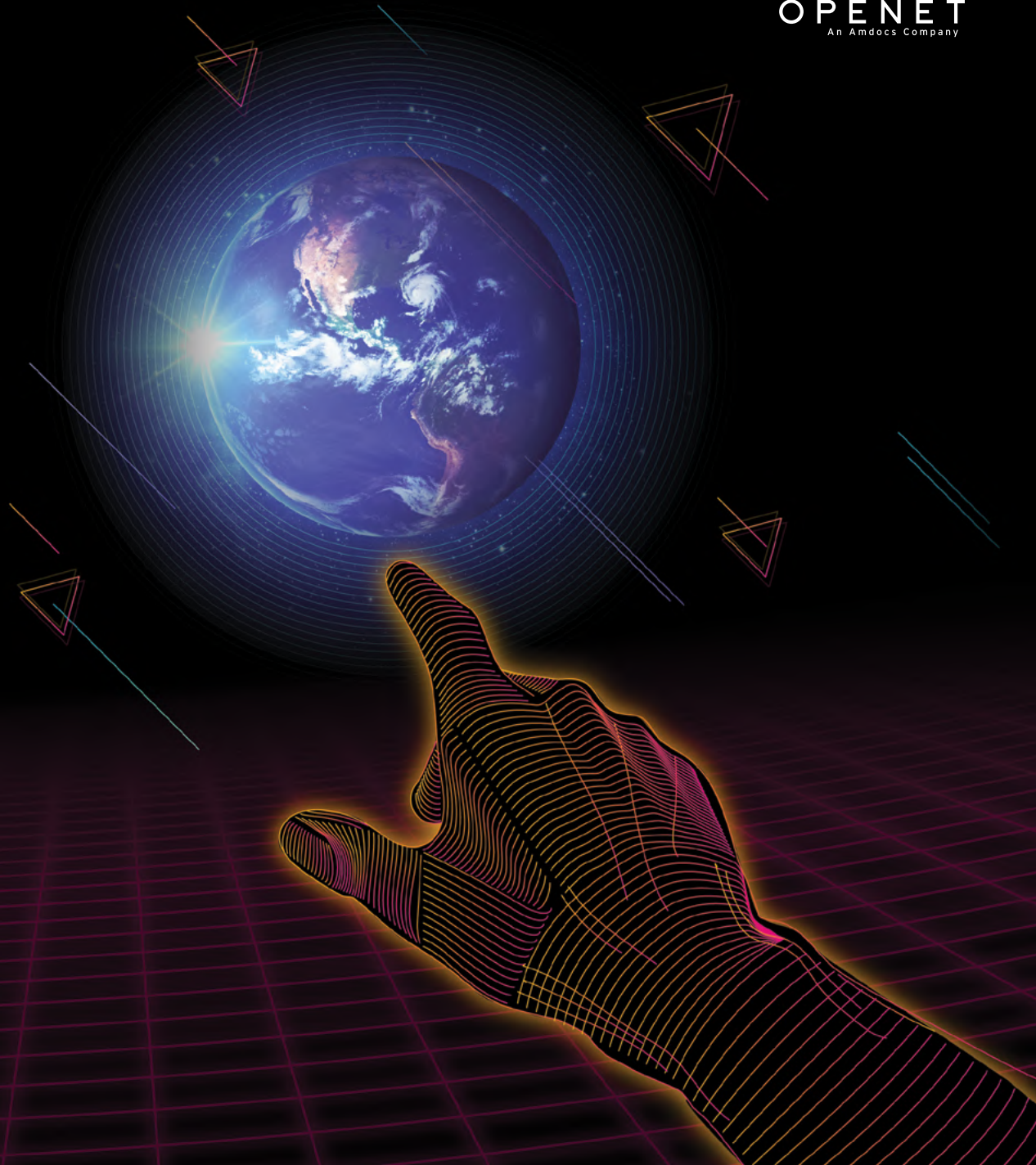


Amdocs 4.0:

40 Ways to Play in the Metaverse

The metaverse is upon us and provides fertile ground for value creation and new revenue streams. Service providers are in a prime position to both enable and participate in the endless opportunities metaverse has to offer. This eBook explores 40 unique use cases which demonstrate where value is being realised in the metaverse.



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Introduction

These days it seems as though all anybody in the digital or tech world wants to talk about is the “metaverse”. But, what does that even mean?

This north star ambition of Big Tech is centred around the idea of creating a digital experiential ecosystem; a woven tapestry of virtual worlds stitched together to generate a seamlessly immersive digital dimension, so to speak. Sounds rather remarkable, right?

Well, it is and we’ll get to that, but let’s start at the beginning.

The concept of the metaverse has its origins in science fiction and dates back over 30 years.

Since its conception, the metaverse has captivated technology innovators as it encapsulated the boldest ambition for advanced connectivity for many in the digital community. An ambition that, if realised, would embody a culminated manifestation of what was truly possible through technology. The ultimate breakthrough – breaking the barriers into a parallel virtual reality where people could opt to live, work, and play continuously in real-time, in a very real way. However, for a long time, the technology simply did not exist making it an inconceivable thought for most.

The first turnkey moment came when IBM took a chance with their investment in Second Life. Launched in 2003, Second Life attempted to provide a virtual collaboration space for businesses, by even creating its own virtual currency to allow transactions within this isolated space. Although people weren’t entirely privy to – let alone keen on – a SIMs-type workplace with the arguably primitive technology that made it possible at the time. Coupled with a lagging market demand that could not accelerate the investment needed to research or run the technology it required to develop further.

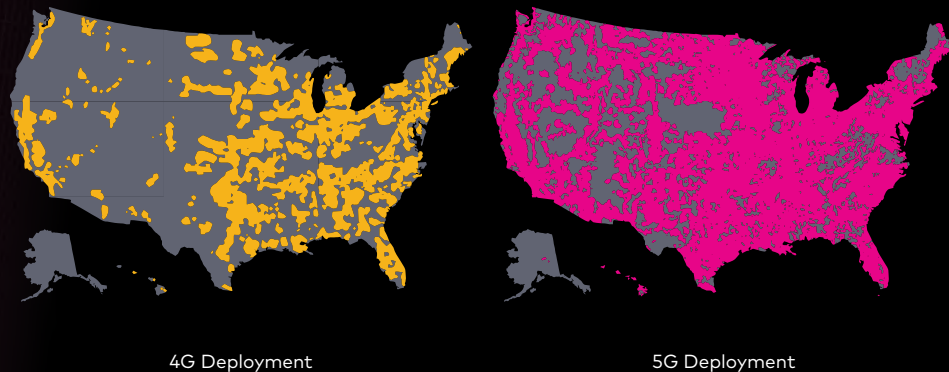
In time, it was the gaming industry that tipped the scale – creating the demand, and ultimately supplying an industry-wide focus on high-quality digital interfaces. The graphic and technological developments that were evolving within the industry, and growing demand for higher resolution graphics, lower latency in commands, and an increase in possibilities within games pushed for further pioneering within gaming houses. Games like Fortnite from Epic Games transformed how the industry looked at immersive reality in commercial terms. The market appetite was undeniable, and the underlying technologies needed to catch up to the increasing demand of users, and as the industry grew, it started to have a spillover effect into other graphics-based and digital-focused sectors.

Why 5G Matters to Delivering the Metaverse

Today, technology is on the brink of fully realising the endless possibilities of what is now widely known as the metaverse. The dawn of standalone 5G arguably answers all underlying questions about the network. With a network capability able to provide ultra-reliable low latency communication (URLLC), while also satisfying the quality of service (QoS) issues, guaranteeing the quality of experience continuously through dedicated service slices is a given. The metaverse will require high throughput and URLLC means that the network is optimised to process very high volumes of data packets with a massively low tolerance for delay. This means no buffering, and an unprecedented level of real-time capability is imperative in virtual reality (VR) experiences.

Delivering the service, managing the QoS and monetising the digital assets is all now entirely achievable. It will inevitably take further time and development for VR/AR device creators to finesse the headsets and other accessories that will provide a gateway in ensuring that these become more accessible and affordable in due time for mass consumption. Lowering the barriers to entry for consumers will be critical in making the metaverse a successful ecosystem in commercial terms. Much like in the physical world, people will need to be drawn into the industry and this will depend on a variety of socioeconomic factors that channel a demand for interacting with peers and friends in unique experiences.

Nationwide coverage by type of network, 2 years after launch



Source: CTIA, July 2021

Pushing the Digital Frontier

In theory, we could be looking at a digital oasis that makes every imaginable virtual experience possible. From travelling the world by climbing into a 3D Google Maps to attending every concert of your favourite artist's world tour, virtually. The metaverse offers a lot for those who would prefer not to leave the house – the ultimate convenience. In an increasingly globalised world, the metaverse means that we can rendezvous with friends in New Zealand on a camping trip in Yosemite, from the comfort of one's own couch.

Everything is made possible; our imaginations are the only limitations.

Beyond the user benefits, the metaverse proposes an ever-expanding commercial space for big brands to push digital products and services with very little overhead costs. Some may have concerns with the indulgence or potential exploitation of some unfavourable practices, which also needs to be addressed in the research and development of the space much like in the central shopping district of any modern city. For advertisers and bigger brands, this will be a fertile new playing field that offers more customised experiences for individual users. In a sense, it will be the equivalent of potential customers jumping inside a billboard to find out more about a product or being able to instantly buy the advertised deal with little effort. Put simply, the immediacy and interactivity of the metaverse will arguably redefine retail and how we engage with brands as a society.

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CHAPTER 1

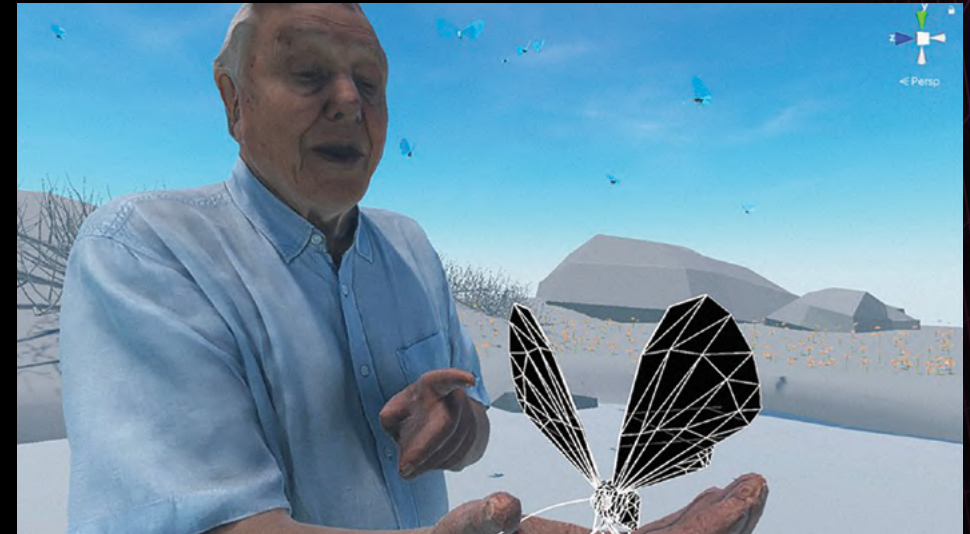
Hyper World Experiences

What is a 'hyper world' experience? The technological advancements over the last few years have created a burgeoning market in virtual reality and augmented reality experiences. Sensory simulations of a world that is familiar yet elevated, or simply made as colourful as we want. In this chapter, we explore the gateways to the metaverse accessibility, including some of the experiences that we can expect will drive mass adoption across multiple industries.



EE Launch Green Planet AR Experience

EE has curated an AR experience for the public to enjoy by walking around a variety of real natural environments from across the planet, all through a 5G-enabled device. The objective is to raise awareness of environmental issues while showcasing what 5G is capable of. The simulation gives access to five digitally enhanced realities: Rainforest, Freshwater, Saltwater, Desert and Seasonal. All of which are made possible through a mobile phone device and powered by EE's 5G network. Come to think of it, joining David Attenborough for a walk through the rainforest does sound like a nice way to spend an afternoon. This is just one example of the type of novel experiences that service providers can offer to drive consumer engagement in the metaverse.



Creating the World You Want to See

Spectacles are reinventing wearable devices through augmented glasses which allow one to graphically (well, visually) overlay anything onto a real-world backdrop. The technology designers at companies like Spectacles are crafting immersive experiences such as walking through a poem or visualising how a valley would have looked 200 years ago. Giving people the ability to see beyond their immediate environment and physically walk through an enhanced reality.

Rethinking spatial interactions will be key to making the metaverse an engaging experience and a compelling proposition for consumers. The pervasiveness of wearables, which are expected to provide a gateway into experiencing the metaverse. While the lens technology might have some way to go before it becomes accessible to the masses, the underlying network latency to support such devices is already here.



Making the Metaverse Accessible

Google is in development to create the next generation of AR glasses alongside the Big Tech companies such as Meta (formerly Facebook), Microsoft, Apple, and Google all of which are rowing in on the wearables market. This is indicative of two key points - first, the metaverse has suddenly made investing in the development of high-tech wearables (beyond the plateau of smart watches) an attractive proposition. And two, the competition within the market bodes well for consumers as this will lower the cost of entry for people looking to immerse themselves in everything the metaverse has to offer. However, currently, extended reality (XR) hardware is not entirely ready to unleash the metaverse for all. The required headsets and associated tech are either too expensive or too bulky to make an attractive proposition to most people. So watch this space for all upcoming developments!



Advancing 5G Wearables

Today, VR devices are largely reliant on Wi-Fi and carry with them a slew of components to grapple with. This has caused some frustration in the market, thus slowing down VR headset uptake by consumers. Addressing this will be key as operators seek to gain a foothold in the metaverse application market. As such, Verizon and Motorola have partnered up to attempt solving this commercial issue by creating a '5G neckband'. The concept is to push manufacturers to create lightweight headset designs and leave the connectivity, processing, and power to the neckband. More importantly, the neckband boasts embedded 5G antennae to give greater mobility and network access. As Verizon put it in the product's statement of intent: 'we're making 5G wearable'.





Audi to Launch In-Car VR

In March 2022, Audi announced its partnership with Holoride to bring VR entertainment to its automotive fleet. Holoride creates what they refer to as 'elastic content'. This translates as the enablement of passengers to play interactive games using a connected VR headset, where the in-game experience adapts to simulate the motion of a real-life car. The idea is that the virtual gaming experience can become even more immersive to incorporate more than just immersive visuals, including movement. This means that if you are playing a game in which you are flying a spaceship, when the real-life vehicle accelerates or turns so will the virtual spaceship. These types of unique entertainment options will give the edge to car manufacturers who are looking to pitch the next in-car connected services bundle.

That is, until the motion sickness sets in!



Transporting the Olympics 2022

While the Tokyo Olympics may have been the first Olympic Games to be obstructed by a global pandemic, it was also the first to enable an immersive, remote, live streaming experience made possible by way of 5G. Initially scheduled for 2020, the delay allowed 5G rollouts to mature in the interim to enable the virtual experience audiences enjoyed remotely two years later. The delayed Tokyo Olympics set a precedent for mainstream viewing of similar global events in the future. The Discovery+ channel was one of the main promoters of live and immersive access to the Olympics.

Virtual Tourism

This metaverse application may sound alien to those who think there is no comparison to the physical and real-life experiences of a new place and/or culture. However, virtual tourism is predicted to become a popular use case for virtual experience creators. The premise that people could travel the world without the need for a passport, let alone allocate the time or resources to physically change time zones, may have been inconceivable until now. Immersive virtual environments curated and crafted to mimic the real-life experience of any global destination – even wonders of the world – would allow those on a budget to broaden their horizons and indulge in some virtual R&R.

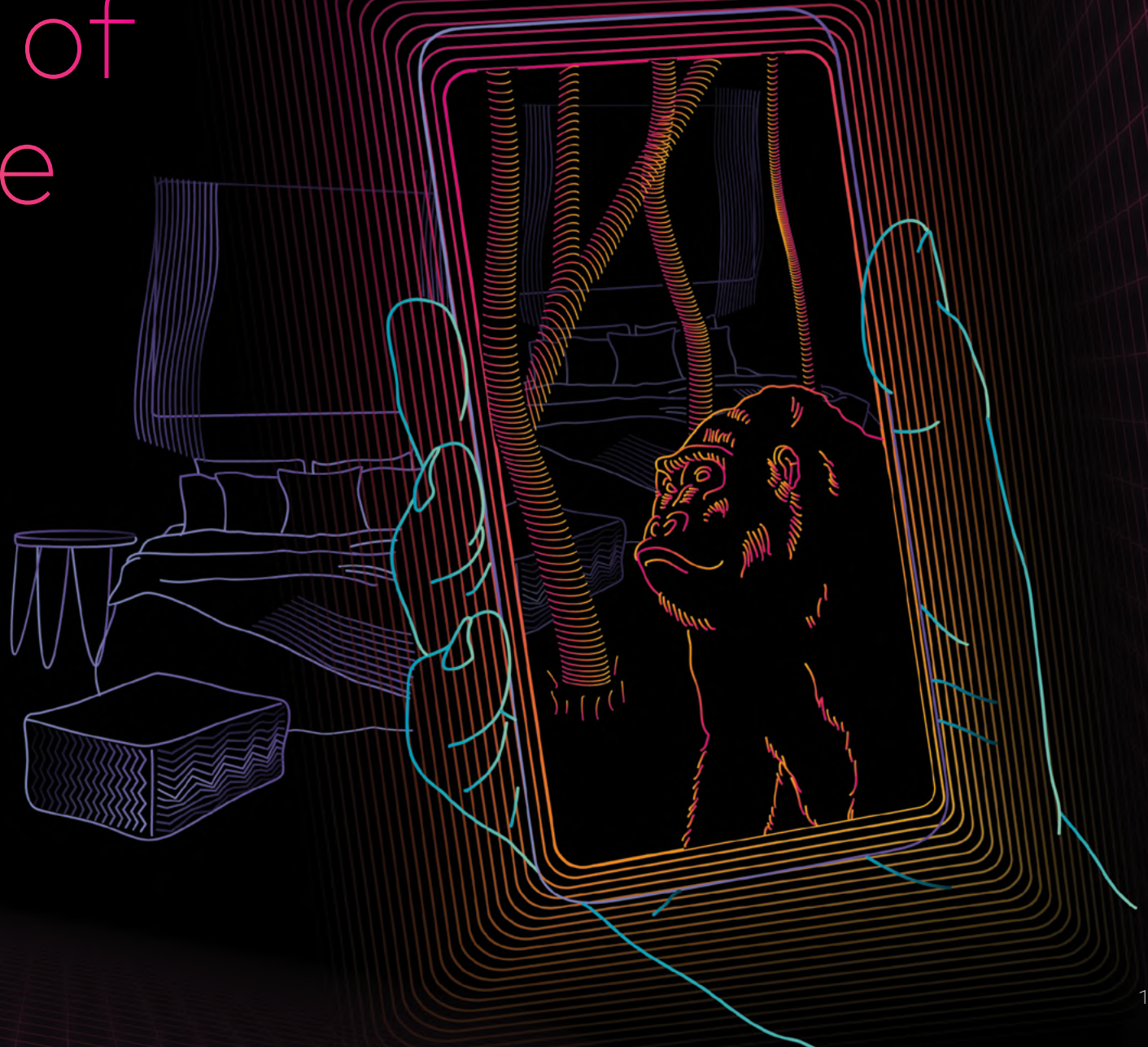
While possibly standing as a prime example of more valuable applications will be the augmented reality use cases which enhance the real-life experience of a place by overlaying more information while in-situ. For example, someone visiting the Great Wall of China or Angkor Wat could be aided by a virtual guide providing nuggets of history as they traversed the site. The tourist might then be prompted with the nearest restaurants and the top reviews. Apps like WorldAroundMe and Smartify are already providing this service.



CHAPTER 2

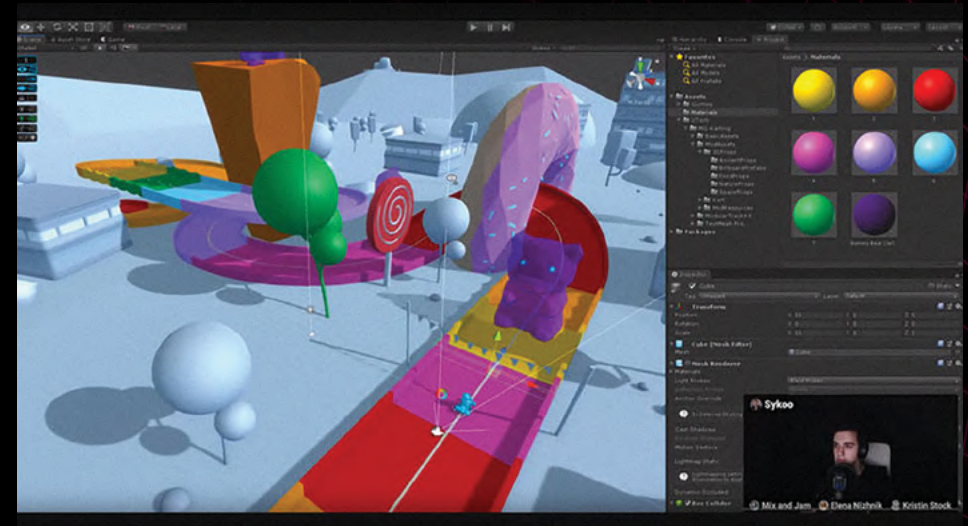
The Apex of Immersive Gaming

The gaming industry is the juggernaut of increasing investment in the metaverse. Game creators have evolved their in-game worlds to incorporate an increasingly diverse mix of interests to keep users stimulated and engaged for as long as possible. This has resulted in these worlds becoming metaverse-type ecosystems where every whimsey can be indulged virtually. This chapter breaks down the ever-expanding potential of gaming applications in the metaverse.



Disruptive Game Making

In the same way that the industry witnessed an explosion in app developers as access to intuitive tooling came online, the metaverse presents a similar catalyst for the democratisation of virtual experience creation. There is already a plethora of games in the metaverse for people to engage with, but half the fun (and investment) seems to be in actually designing the games. The metaverse has sparked interest from consumers in getting hands-on in the process and creating the very virtual worlds that they spend so much of their time in through never-ending feedback loops between developers and users on chat boards and online forums. Facilitating the design and build-out of these virtual environments will become lucrative over the next number of years if the popularity of games like The Sims and Minecraft are any indication. These game creators are looking to craft increasingly immersive experiences which are adapted to put interaction and a sense of place at the centre of their creations.



Building Worlds of Magical Realism

Watching live events from angles such as bodycams on athletes and referees has been around for some years now. However, the potential of this point-of-view experience is currently materialising as devices and network latencies continue to improve. Upgraded stadia and venues will have hundreds if not thousands of camera angles to choose from – thereby, providing an increasingly multi-dimensional immersive, flexible, and even personalised viewer experience. VR has come to mean different things as the technology evolves, and as such, increasingly expected to soon talk about "XR" as a combination of virtual, augmented, and mixed reality experiences.

In the wider VR and AR market, some big names in gaming are piling in and will become more familiar. Examples include Niantic's Harry Potter: Wizards Unite which plans to employ 5G to seamlessly combine our real world with the world of wizardry. Niantic is the creator of Pokémon Go, which was arguably the first example of augmented reality mobile gaming that became a mainstream, viral craze.





An All-Immersive Gaming Experience

The impact of the metaverse on the gaming industry will be monumental. All games, not only limited to the big franchises, will be effected by the experience gains the metaverse provides. In a metaverse gaming environment, players will be able to transport themselves within the very fabric of the game itself and engage in a whole new way with the hyper-graphic surroundings. In fact, it will truly feel as though you are physically inside the largest game world imaginable.

While the metaverse will make gaming astronomically more immersive through VR and AR technologies, the metaverse will also ensure stronger content engagement and virality. The gaming industry discovered a decade ago, when games moved from hard copy to the cloud, that its added value was in the creation of communities around the games themselves. Accordingly, engagement and virality are essential to a game's commercial success. The metaverse brings these components together by providing an all-immersive gaming experience where the community no longer lives in the chatbox on the bottom-right of the screen but you instead reside in the virtual chat room along with your chosen community.



Play-to-Earn Games Set to Redefine Gaming Revenues

The ways in which games are monetised will change dramatically in the metaverse. The commercialisation potential of gaming will increase exponentially with the integration of e-commerce platform capabilities and collectable digital assets like non-fungible tokens or "NFTs". Users will be able to interact with and support their favourite players in new and exciting ways. This will mean that the number of touchpoints and interactions can be capitalized on, while the number of added value experiences can be monetised to grow in all directions. In simple terms – if you can imagine something, it can become real the metaverse, and money can be made from it in both dimensions.



One example of such opportunity in the metaverse market is play-to-earn games. These are games that merge the fundamentals of a game streaming service with e-commerce functionality. Players can participate in a game in the metaverse and earn 3rd Party income for the privilege. This almost sounds too good to be true, right?

Well, gamers are already proving that this hobby can become a profession as successful gamers can already earn big money through sponsorships, while also drawing huge followings of fans who pay to watch them play live both in person and through relevant online streaming platforms. The metaverse will only catapult this to new heights and further democratise the revenue-making potential of gaming for all parties. This new kind of in-game economy will be a real game-changer – pun intended.

Watch this space.



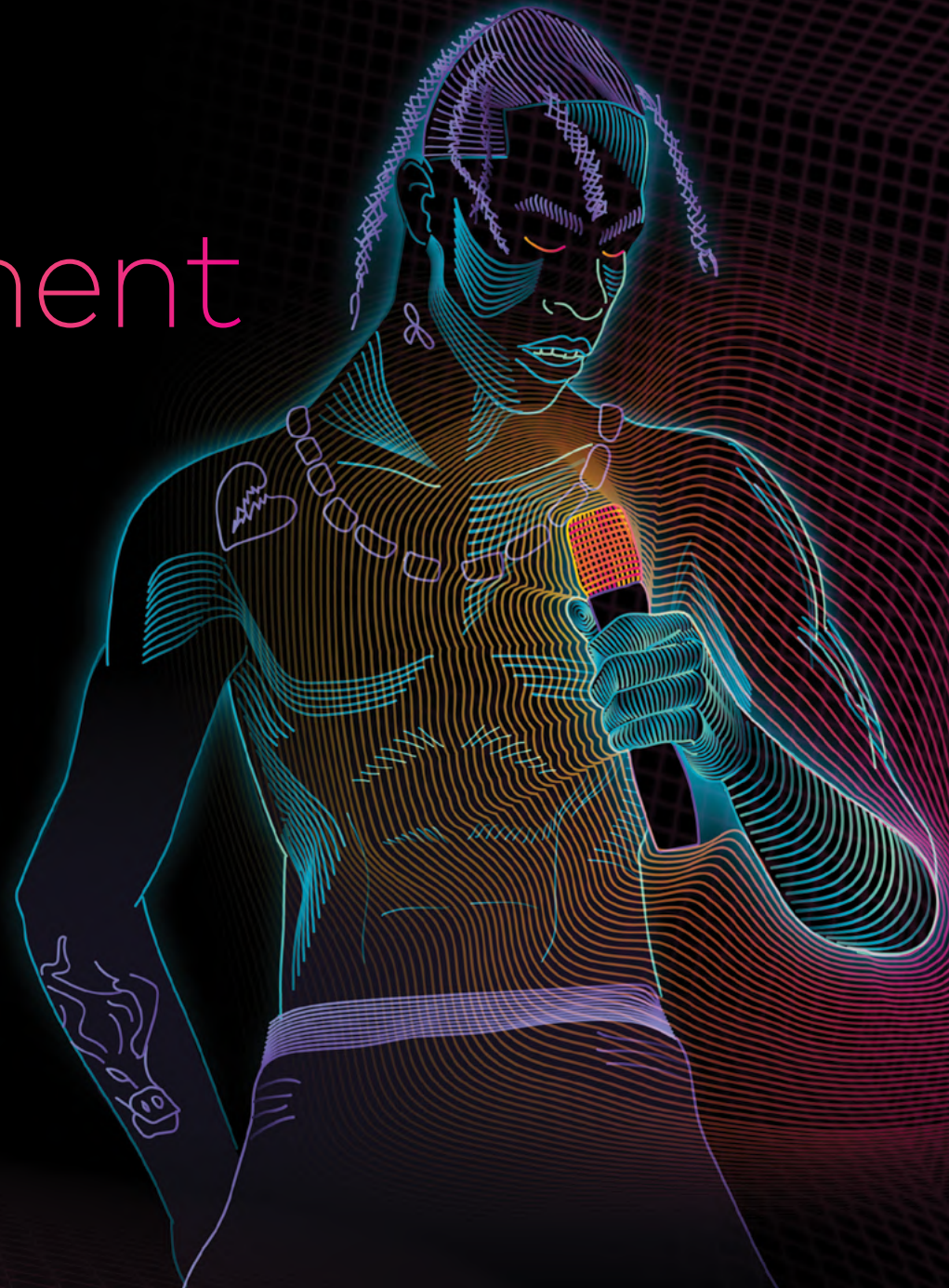
The Sky's the Limit... or is it?

Bloktopia presents a novel twist on virtual reality by creating a metaverse that expands vertically rather than horizontally. This vertically stacked environment comes in the form of a 21-storey metaverse skyscraper which is a nod to the coin supply of the first cryptocurrency at 21 million Bitcoins. Users can "play, earn, learn, and create" by buying and selling their own virtual real estate in this virtual tower. Bloktopian NFTs come in the form of ADBLOK, JOBE, and REBLOK, which can generate profit when traded in the buying and selling of virtual property and advertising space. In this metaverse layer, users can visit brand-sponsored virtual spaces where brands are enabled to promote and drive brand engagement by cultivating direct virtual relationships with users. This creates a valuable form of passive income for Bloktopia players.

CHAPTER 3

Nonstop Entertainment

The metaverse ushers in a wide gamut of entertainment arenas for consumers to enjoy. Ranging from spectator sports to music events, and even indulging virtual hobbies – there is something for everyone in the metaverse. Many real-world entertainment avenues are already embracing a hybrid experience by offering different audiences the atmosphere of a physical arena while benefiting from augmented reality extras to enhance the individual user experience. In this chapter, we identify the forms of entertainment expected to populate the far corners of the metaverse.



Musicians Selling out Virtual Tours

Music artists Marshmello, Travis Scott and Ariana Grande might not feature highly in the playlist of the average corporate executive, but they have already made millions in the metaverse. Performers are tapping into showcasing their concerts in the metaverse using gaming platforms, such as Fortnite, to reach millions of music fans with live performances. Scott's in-game live event attracted over 12 million viewers and may point to the future of live entertainment. With the capacity and scaling potential made available with 5G, the expectation is for these numbers to continue to grow. Creating a massive opportunity for service providers to participate as 5G coverage is extended into 2023.



HIKKY & NTT DOCOMO

In March 2020, NTT DOCOMO launched a 5G commercial services offering. Initially, "Shintaikan Live" was a 4G offering focused on the streaming of live music events. With the advent of 5G, NTT DOCOMO was able to significantly enhance this online experience by offering multi-angle video distribution, augmented reality figures of artists in 3D and the enablement of live transitioning of consumers to mail-order sites direct from the experience 'zone'.

Virtual reality startup, HIKKY, has proven the scale of metaverse investment by raising 6.5 billion yen in an initial round of funding at the end of 2021. HIKKY and NTT DOCOMO are partnering to dramatically advance the world of VR experiences. HIKKY aim to accelerate the realisation of the metaverse with the underlying support of NTT Group's 5G network infrastructure.



The Vegas of the Metaverse

Online gambling forums have been a regular feature of the browser histories of many poker-mad 20-somethings for quite some time. Imagine if the hours spent on these games were replaced with a fully immersive metaverse casino experience. Particularly for strategy card games, such as poker, where reading body language is central to the game. Virtual reality casinos allow for games to come alive and for players to enjoy the option to speak with one another and get a read of their opponents; in avatar form albeit.

Pokerstars VR allows players to engage in a range of casino games, including poker, blackjack, roulette, and themed slot machines where they can win real money prizes. In February 2022, Decentraland, a browser-based metaverse platform, reported its metaverse casino ICE Poker raked in \$7.5 million in the previous three months. While both impressive and concerning in equal measure, this does prove that the virtual gambling world has a big stakes future ahead of it.

Meta Monday Night Football

The way sports are consumed is already changing with premium fan packages a natural evolution from pay-per-view or subscription-based access to big games whose rights are bought up by specific content channels, like eir Sport or BT Sport. Maximising the earning potential of each event seems to be central to sports entertainment today. This was shown as the industry were early embracers of VR and AR technology, providing fans with a stadium experience from home and the ability to view in-game stats live.

BT has been exploring how to best enable new immersive sporting experiences through their 5G Edge-XR project. The aim is to demonstrate how 5G networks combined with cloud graphics processing units can allow fans to view a sports event from any angle across a range of devices, from their smartphone to their TV to their VR headset. "Imagine a situation where you have a virtual season pass ... fans at the stadium are a mix, with some that are physically there and some that are not", BT Sport director of mobile strategy, Matt Stagg.





Merging Worlds with Real Utility Tokens

Meta Hero is one of the first trading platform to bring 3D scanning technology to the metaverse. The platform allows users to convert their real-life assets into NFTs to trade in the metaverse. So rather than having parallel worlds of potentially duplicated assets – one physical and one digital version – users can blend the worlds in which their assets are tradeable.

The addition of meta scanners to the metaverse technology ecosystem unlocks a wide array of interesting use cases from 3D printing to building your own in-game avatar. The Meta Hero platform has its own native NFT, \$HERO, which can be used to trade within the virtual marketplace for the buying and selling of assets and to utilise the platform's 3D scanning functionality.



Art in the Digital Age

Creating a virtual forum for assets to be engaged with and traded is a central ambition of the metaverse. Art is one asset that is appreciated and auctioned to a global audience. This presents a prime industry for appropriation to the metaverse arena. A recent example of this was how a New York artist, Beeple, responded to the restrictions of the Covid-19 pandemic on his ability to ply his trade. As real-life galleries shut their doors to art enthusiasts and collectors, Beeple started to experiment with what was possible in a digital medium and through VR technology.

This led to Beeple producing original pieces of digital art online and selling these as pioneering forms of art with sales amounting to over \$100 million. Unsurprisingly, other artists have followed suit and are earning hundreds of thousands of dollars for their digital art. The metaverse offers a stronger means of authenticating art through NFTs as NFTs provide a definitive solution to what gives assets value. In this way, digital art can be 'tokenised' where a piece of art is put on a blockchain and this allows it to be sourced, verified, and authenticated to give collectors peace of mind.



Immersive Theatre

Aside from the virtual dimension, the metaverse will also pervade our physical experiences in the real world. The connected world of devices we now live within, the 'Internet of Everything', is primed to populate real-world data, geospatially aware content and digital twins into the metaverse which will allow us to simulate our physical surroundings with incredible accuracy. The omnipresent nature of information is going to transform industries, including the world of entertainment experience. Theatre, live music performances and even escape rooms are merging the physical and virtual to create unique augmented experiences for their audiences. The national theatre of Korea has even brought the metaverse to the stage with 'Ultraworld', a theatre show which takes the audience inside a computer game to examine the ambiguities of the real and virtual worlds.



CHAPTER 4

Shop 'Til You [Virtually] Drop

Consumerism and convenience go hand in hand in today's marketplaces, and the metaverse is no exception. The new and improved virtual high street will promote attractive unique sales and marketing channels for brands. In a new level of convenience and customer experience in eCommerce that has never been possible before. Taking the experience and indulgence of online shopping to new heights. In this chapter, we explore the versatility of the metaverse within retail and the creation of an entirely new marketplace.



The Meta Economy

The metaverse is essentially an infinite commercial space, where digital lifestyle assets can be promoted and consumed ad nauseam. This presents a lucrative opportunity for brands to get in front of consumers in a whole new way – by shifting the paradigm on the role of the consumer to that of a user, and customising the individual's experience accordingly. This requires sophisticated smart technology sufficient enough to archive data, automate processes like transactions and recommendations, as well as ensure data privacy and security.

Blockchain is the core technology that enables the creation of digital assets or NFTs on which the virtual economy of the metaverse relies. The metaverse facilitates brands to design more dynamic marketplaces for their digital assets and enables consumers to interact and assess their desired NFTs. Furthermore, the metaverse also allows for NFTs to be distributed across other 'meta-verticals' such as gaming, where in-game collectable assets can be acquired and traded between players. Thus, the virtual ecosystem and economy propagate and sustains themselves, making the applicability of this endless.

The First Metaverse Fashion Week

In March 2022, the world was able to witness some Fashion Week shows held entirely in the metaverse. Large scale events that draw a global attendance each year were halted by the pandemic and many events companies had to develop online platforms to support virtual promotion substitutes. The fashion industry relies on Fashion Week to showcase new collections and connect with retail buyers. The pillar event has already embraced the metaverse as the new stage to be seen. For the first time, models and attendees alike flaunted digital outfits as their avatar-selves from the world's leading fashion designers.

Metaverse platform, Decentraland, hosted the event with a multitude of global brands on exhibit and thousands of attendees able to experience fashion shows, attend live music events at branded after-parties as well as try on digital clothing directly from the catwalk. Fashion Week is one of the first mega-events that has exemplified all the ways in which the metaverse can – and will – be commercialised. Decentraland is notable as one of the few prominent open metaverse platforms where users can buy virtual plots of land, as NFTs, using a cryptocurrency on the blockchain. As such, investors are already purchasing plots of digital land in anticipation of building shopping hubs.





Virtual Reality Department Stores

In 2015, there was a new dawn for retail with the first virtual reality department stores. eBay partnered with Australian retailer, Myer, to create the world's first virtual reality department store with more than 12,500 products for sale. Dutch Design Week 2015 also saw British designer, Allison Crank, create a virtual reality shopping centre that allowed users to commission bespoke items. Novel, right? Well, in fact, Allison took it one step further and had digitised zoo animals and floating neon signs accompanying people as they browsed.

Today, the way we shop online is set to drastically change with the metaverse. One of the biggest obstacles for online marketplaces is that customers are unable to see what a piece of clothing, for example, would look like on their body shape and size. However, the metaverse unearths a multitude of possibilities to overcome problems like this by enabling users to try on products virtually through body-scanning technology and see whether a particular outfit suits them. This type of use case is set to unlock huge untapped potential in the e-commerce space. Even retail houses such as London's iconic Selfridges now exists in the metaverse, and sells fixed-price "over the counter" NFTs in its physical store to be used for purchases made in its digital space.



Let's Have the Robots Stock the Shelves

Japanese convenience store chain, FamilyMart, has trialled remote-controlled robots at selected stores in Tokyo. Its mission is to utilise robotics to improve efficiency and reduce costs by having the robots stock the shelves. The robots are designed by Japanese robotics manufacturer, Telexistence, and are controlled by employees, enabled by a VR 'augmented workforce platform'. Some might say if the employee is immersed in the exercise through a VR headset in the backroom, is it really introducing any efficiency gains?

While that is a valid question, the essence of the initiative is more creative to demonstrate that the augmented world is rapidly finding itself entrenched in our day to day lives.

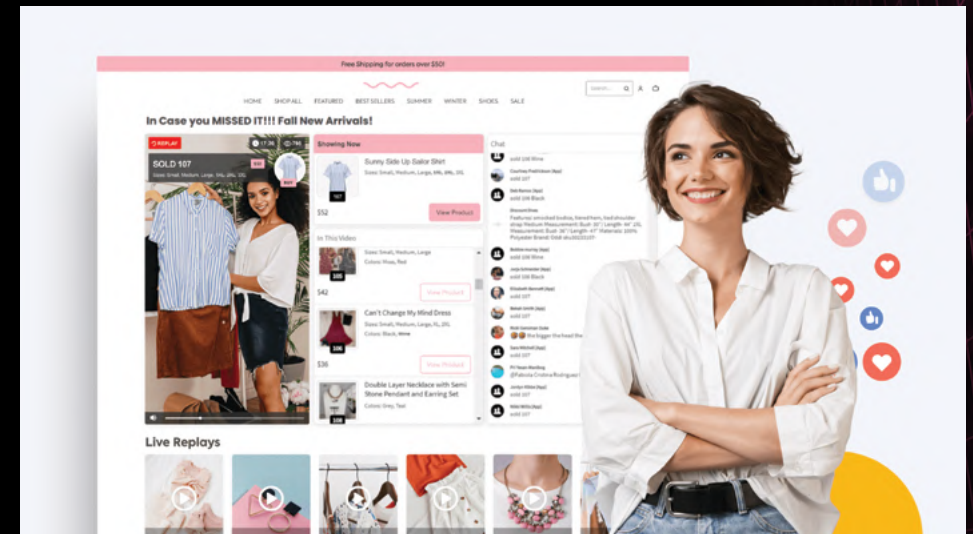
AR Live Stream Shopping

Described as “a cross between a video stream, variety show and group chat”, live stream shopping is becoming increasingly popular in APAC and beyond. More and more, brands are utilising ecommerce apps and social media platforms, including Instagram Live, Twitter and Amazon Live, to promote and trade their products. Big brands often elect social media influencers to tout their products, demonstrate the value of the items and answer questions in real time.

For brands engaging in live stream shopping, they enjoy the benefits of reduced reliance on physical stores, a more efficient sales process, and the ability to encourage the customer towards the checkout to improve offer uptake. One draw back is that customers can't interact with the product as they would in a physical store. However, the introduction of augmented reality to the live shopping experience may change all that. A 'Beauty Try-On' feature is currently enabled by YouTube for online tutorials, which is an AR ad format that allows viewers to try on beauty products virtually before they buy. This could soon be a central value-add feature of live streamed shopping experiences. Watch this space.

'Phygital' Retail Experience Ascendence

As the term suggests, 'phygital' is the merging of physical retail and digital retail to capitalise on both channels in order to create greater brand awareness and sale conversions. Traditionally, physical retail stores required a minimum turnover to remain viable. However, phygital retail proposes that a physical brand presence can serve its purpose without making a single sale. In a phygital world, physical outlets serve primarily as brand awareness sites that allow prospective customers, who may have browsed a brand's products online, to engage in a more tactile experience before clicking 'checkout'. Makes a lot of sense, right?



Now more than ever, brands are adapting their go-to-market strategies to cater for the Digital First-generation who now have a disposable income of their own and are looking for retail experiences that speak to their digital consumption habits. A "hybrid" approach is set to be the next big shift in retail to accommodate this accelerated change in consumer behaviour. In recent years, new brands have often opted out of occupying physical outlets entirely to reduce overhead and focus on a strictly digital approach. However, consumers are often looking for new experiences to ensure their loyalty, which is common knowledge for best performing brands today. Physical stores offer brands the opportunity to deliver experiences that e-commerce equivalents do not currently support. That being said, the metaverse retail norm will usher in a whole new form of brand experience.



Not So Real Estate

Are you shopping for a holiday home in the south of France yet hoping to save some money on airfare?

If so, why not tour prospective properties in the metaverse? Avoid the hassle of juggling estate agent appointments and sacrificing endless weekends travelling between dispersed locations by looking around properties from the comfort of your own sofa. Companies, like Matterport, are creating 3D digital simulations of properties to allow clients get a 'feel' for the space and light before committing time to an in-person experience. 360-degree video tours are already widely available through online property aggregators today; however, it will take a little time before full virtual tours are commonplace. Whether buying a home or a pair of shoes, the metaverse shines when it comes to providing a convenient alternative to in-person administration.

While this may all still seem to be entirely fictional, it is anything but that. To give an idea of the scale, like Decentraland, The Sandbox is another example of a real estate marketplace in the metaverse that customises plots of land, bought and sold using cryptocurrency on the blockchain. While the thought of buying, selling and/or developing plots on a mobile device or web browser may seem like a gamble, three plots next to Snoop Dogg's virtual mansion The Sandbox sold for a total equivalent of \$1.23 million dollars in December 2021.

CHAPTER 5

Consuming an Infinite Billboard

Marketing in the metaverse is expected to generate considerable investment as brands continue to onboard purpose-built virtual campaigns. Impressions are gold for driving brand awareness as evidenced by the forest of push ads that we already contend within our digital experiences today. However, what if we were to encounter a more subtle, nuanced customer journey with a brand that did not involve interrupting our overall experience? In this chapter, we delve into the ways industries are gearing up to capitalise on the mass attention the metaverse is so rapidly cultivating.

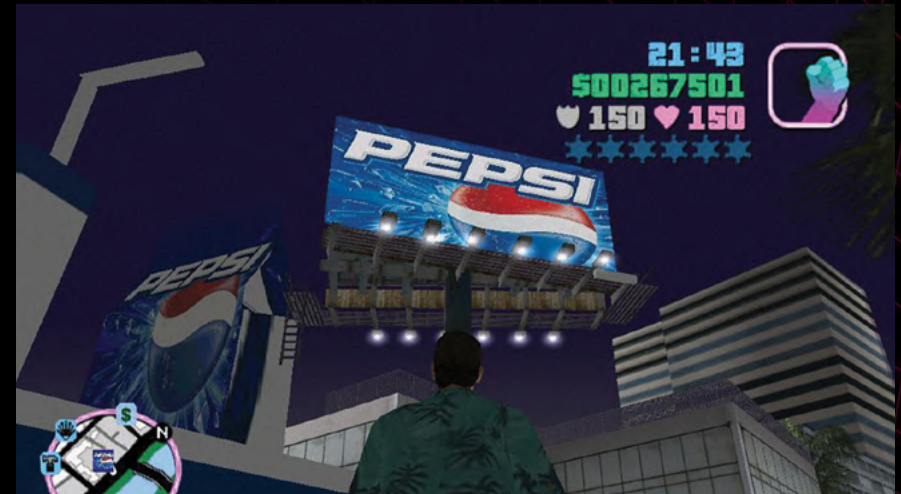
Games – from Entertainment Channel to Sales Channel

Games have long been active staging arenas to drive brand awareness through advertisement. For instance, a Grand Theft Auto player walking through the streets of Liberty City and being inundated with billboards totting Pepsi and McDonald's ads. Beyond advertising and brand engagement, the metaverse is set to catapult gaming into becoming the world's most powerful sales channel. The larger game franchises, like Fortnite and Call of Duty, boast massive player bases that brands are eager to tap into. These captured audiences are already intently focused on the in-game content, so it offers an invaluable and massively effective channel for brands to capitalise on.

Therefore, brands are becoming more strategic by partnering with game creators to go after more of the pie. In 2020, Animal Crossing was a game that was a major hit, fully recognised by design houses Marc Jacobs and Valentino who created new looks for the 30 million players. In another example, the Gaming giant, Fortnite, recently partnered with Nike to offer players digital versions of their shoes ahead of time before the real-life launch. As such, perks of this kind where those in the metaverse are granted advanced access to new assets will become a mainstay of go-to-market strategies in the future.

Inserting Advertising Natively within the Experience

Advertising is interruptive by nature. This can be unsavoury to some consumers and thus scar a brand's reach if the customer's tolerance for interruption is breached by a particular marketing campaign. Alternatively, inserting ads more naturally within a platform experience allows brands to engage consumers more effectively while steering clear of causing brand fatigue. Native in-game advertising is a more subtle approach to marketing in the metaverse where a brand becomes part of the overall game environment rather than an aggressive interruption to gameplay.





According to findings by Bidstack, an in-game advertising platform, this approach enhanced gameplay realism for 95% of players surveyed and increased purchase intent by 12%. Opportunities for creating advertising revenues in the metaverse range from sponsored content, like discrete branding of an in-game location, to immersive native ad experiences, such as Nikeland which allows users to engage in gameplay while organically exploring Nike's range of products in virtual reality.

Creating Novel Brand Engagement Opportunities

Animal Crossing has become the fertile digital ground for brands to innovate with their brand awareness strategies. For example, Deliveroo ran an impactful marketing campaign within the game that deployed digital delivery riders to perform deliveries across the island game environment. Players would receive a surprise delivery on their in-game virtual island along with a promotional offer code which they could redeem in real life. Pretty cool, right? Deliveroo reported that 3 million players engaged with this campaign in the first hour alone.

Similarly, Hellmann's mayonnaise brand sponsored a virtual island in the game which they dedicated to their commitment to reducing food waste. Hellmann's asked players to donate their virtual spoiled crops for the cause and this enabled the company to donate fifty thousand meals to FareShare, a food waste charity.





The D2A Economy is Coming

The direct-to-avatar (D2A) economy is emerging and is set to become equally as lucrative as the real-world merchandise economy. For example, the latest virtual Tesla model is pitched for avatars to drive in Tencent's Game of Peace. Avatar identities in the metaverse will be highly curated with ample opportunity for luxury accessory brands to capitalise on this new fashion frontier.

A report by the Institute of Digital Fashion found that 92% of respondents value customisation in curating their virtual avatars or virtual selves. This creates an open goal for the likes of apparel companies to market directly to avatars rather than their real-life equivalents. The fashion industry has instinctively embraced this new virtual catwalk with luxury brands showcasing their latest pieces to their in-game models. To give an idea of the potential revenues, Gucci sold a digital bag for \$4,000 on the online game platform, Roblox. In another example, renowned fashion label, Balenciaga, has partnered with Fortnite to create virtual outfits and weapons that players can purchase to keep their avatars on trend.



The Metaverse Highstreet

Highstreet is a gamified shopping experience in the metaverse where NFTs are traded. Highstreet leverages a 'phygital' (physical and digital hybrid) virtual experience where players can buy, sell, and own real-life products. Users' attention is maintained through the ability to earn tokens simply for spending (investing) time playing the game or completing specific in-game quests.

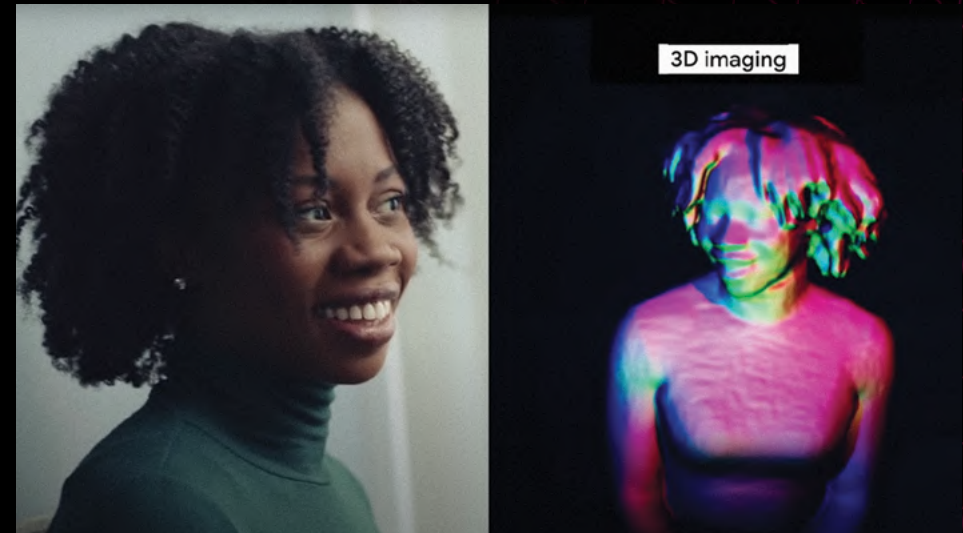
CHAPTER 6

Meet me in The Meta Space

Innovations in VR and AR space are already facilitating meaningful applications for business practices and educational endeavours. From giving colleagues in remote working situations a virtual meeting room to exchange ideas to enabling rural students access to virtual classrooms – the metaverse offers an array of novel applications to facilitate both business and educational experiences. In this chapter, we explore the new ways in which the metaverse promises to enhance the day-to-day activities of people globally.

Making Online Get-Togethers More Immersive with 3D

Google recently showcased an initiative called Project Starline, which is focused on bringing the online meeting and collaboration forward from a 2D to 3D experience. Google has created a 3D video conference booth with the objective of transforming the current, often flat, video chat experience to feel akin to sitting face-to-face with a real human being. It may sound simple and like a somewhat notional change, but Google has expressed that there are many challenges in tricking the human brain into thinking that there is someone physically sitting a few feet away. Some of these challenges include delivering on a clear and texturally rich image, ensuring that the visual changes like changing light realistically as someone moves in the booth and overcoming the audio dilemma of making it sound like a voice is coming directly from someone's mouth rather than through surrounding speakers.



A Fully Immersive Virtual Office

Have you ever thought of what a virtual office would actually look like? Companies, like vSpatial, are creating virtual environments for collaboration that could revolutionise remote working over the coming years. It is no secret that people in services-based professions, who have been able to work from home during the pandemic, are in no rush to return to a physical office full-time. This has meant that businesses are looking for new ways to support this new working model and some suggest the answer lies in virtual reality.

An immersive virtual office experience is one of the added value propositions that metaverse evangelists tote. Arguably an effective method in converting those less engaged in the practical uses of the metaverse has to offer. However, whether or not virtual meeting rooms will become mainstream is another debate entirely. While VR headset technology is developing at pace and will reach a sweet spot once the experiential quality is high enough, at a low enough price point to stimulate mass adoption, it is a matter of simple economics: demand and supply driving cost.





Avatars Without the Blue Tail

We all remember brainstorming workshops in stuffy meeting rooms which were only ever interrupted by colleagues dropping by to ask if the room would be available anytime soon. What if we evolved from a handful of meeting rooms in a building to limitless collaboration space options available around the clock sans interruptions? To experience these spaces and bring collaboration alive, companies are developing avatars to act as visual stand-ins for users of these platforms.

Hesitations around using virtual workspaces often focus on a lack of person-to-person engagement and an abstracted experience that may not always match what can be achieved in a real-life work environment. However, the proposal is that avatars will lend to bridge this gap and create a more personable collaboration experience for users. Enabling successful collaboration will be key to unlocking a long-term remote working standard. The pandemic proved that solitary tasks and short-form virtual meetings can be executed just as well from home, but it will be the facilitation of long-form, in-depth, collaboration that determines the outcome of the standard procedures of remote working. Avatars may go a long way to making virtual working a far richer experience for everyone. Time will tell.

Training Simulations Taken to the Next Level

At a time when many metaverse applications are looking to make virtual equivalents to real-life experiences, what if the virtual world option elevated the real-life activity? Education is an area that has long been notoriously slow to embrace change. However, virtual reality applications are on the rise to enrich practical training exercises. For example, a lecture theatre in a local university is a theoretical learning space. What if the metaverse equivalent allowed for medical students to attempt surgery? Arguably, this would be a far more powerful learning experience.





Acadicus is a company that provides a flexible method for delivering a wide variety of VR training scenarios. Live VR sessions enable multiple instructors and/or students to interact with assets while participating remotely. This type of application demonstrates the objective of the metaverse to a purist, where interactive activities that are performed with a limited capacity in the real world are made far richer with the expanded possibilities of simulated experiences. Flight simulators are already a prerequisite for training pilots because the risks are simply too great to practice using real aeroplanes at thirty thousand feet. The metaverse will open similar avenues of practical learning across many more industries in the coming years.



Enforcing the Law, Virtually

Much like the military, police forces are increasingly turning to virtual reality technologies to facilitate training scenarios. Simulating high-stress events that officers may potentially experience in the field allows the trainees to acclimatise to such stimuli and learn how to cope with otherwise overwhelming situations. Simulations also grant the ability to escalate interactions with the virtual training environments to help trainees to practice how to make critical decisions under high stress. Such training tools include the scenario simulator designed by VirTra.

The Metaverse School

Education tools for the next generation are in the process of shifting in major ways. The technology underpinning the metaverse can be purposed to elevate the means through which students learn and consume new information. Rather than learning about abstract astronomy from the limits of a classroom, why not jump into a virtual spaceship and see it up close? Virtual learning centres could also make education more accessible for people across the world by transcending geographical, demographic or linguistic barriers.

At the end of 2021, Hanoi National University of Education (HNUE High School) announced that it would be the first high school in Vietnam to enter the metaverse. The initiative saw the creation of a virtual learning centre where students from anywhere could experience and curate their own learning journey in the metaverse. Similarly, in Florida, the first global virtual reality high school was launched with VictoryXR, a VR education platform. The high school has its very own metaverse campus where teachers and students can interact virtually as if they were in a physical classroom.

The Military Going Meta

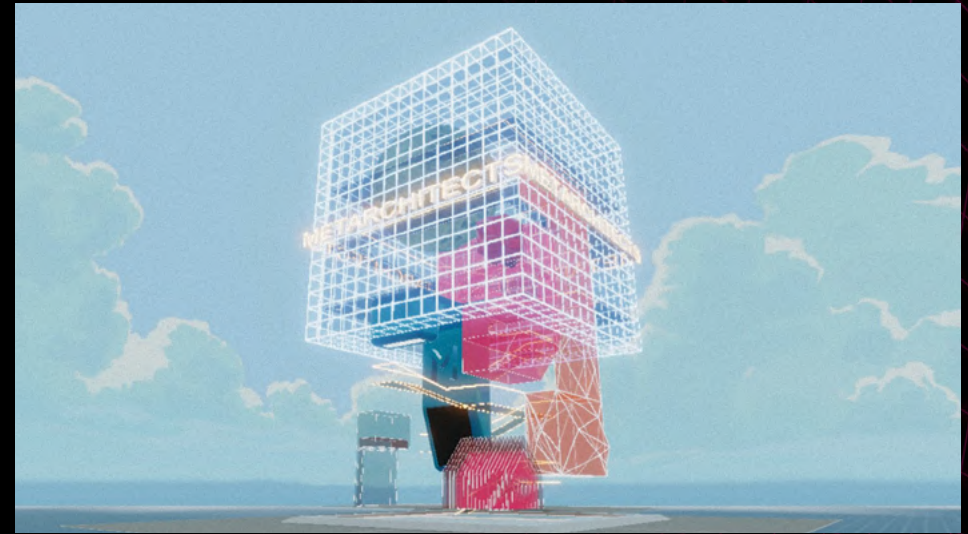
The military sector is always eager to embrace advancements in new technologies and the metaverse is no different. Virtual reality and augmented reality applications in the military have already proven to be successful in bringing value to combat simulation training. Tactical Augmented Reality (TAR) is one example of metaverse technology being used by the military, which provides an alternative to GPS units that would have been used traditionally to identify target locations and fallen soldiers. TAR comes in the form of an AR headset that can display the precise location of a soldier alongside the positions of allies and enemies.



A Design Slingshot

For designers of 3D spaces and objects, the metaverse is set to provide a veritable slingshot effect to the means by which designs are actualised. Companies, like Autodesk, are creating cloud software for digital animation and construction. These software tools are used by engineers and architects to design products and developments in both the real world and the metaverse, fully cost-effectively exploring both form and functionality.

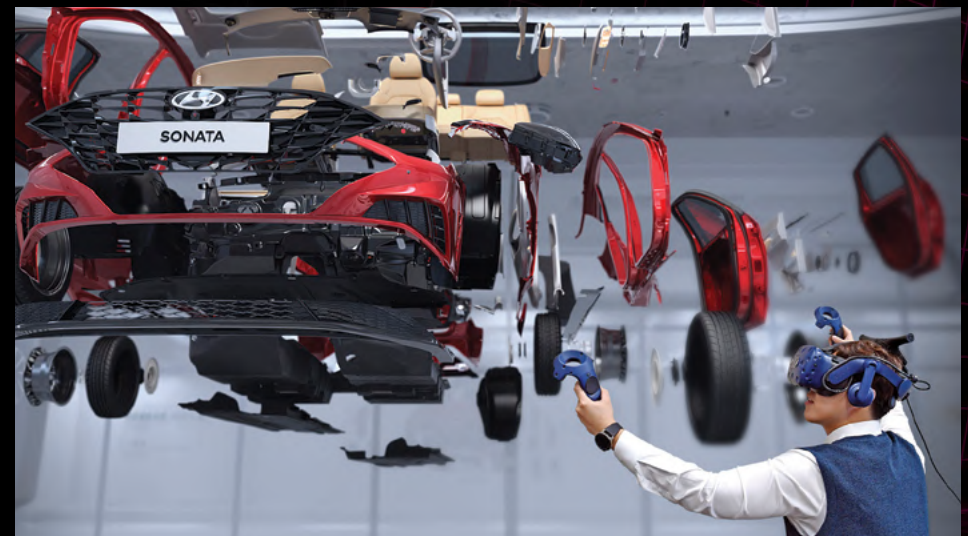
The metaverse has pervaded the architectural community to manifest a new movement referred to as 'Meta Modernism Architecture'. The movement focuses on the promotion of unique architectural expressions across multiple metaverses. The movement was founded by Charlie Sun, a metaverse architect who has designed several virtual galleries for notable curators and collectors globally.



Automotive Aspirations in the Metaverse

The metaverse will generate a significant number of use cases for the automotive industry. As is the case with other design-focused industries, the metaverse is set to provide a collaborative, creative forum for designing new concept vehicles. This will be a considerable leap forward in the kind of 3D forecasting that can be achieved today – giving a more tactile impression of the kind of experience a vehicle will have long before a single piece of fibreglass is cut into shape, saving both time and resources.

As such, this will lend to a greener eco-conscious design process for an industry that is plighted with judgement for its colossal carbon footprint. The metaverse will also provide a simulation environment for testing new prototypes and the innovative systems driving them, which will prove to be particularly valuable for honing autonomous driving technology. Car manufacturers will inevitably continue to capitalise on the gaming world by launching new models in the latest racing environments in the metaverse to whet consumers' appetite for a real-world equivalent.



CHAPTER 7

The Opportunity for Service Providers

The Network: Where the Metaverse Lives

As metaverse-type experience services continue to go live, 5G is set to take things to the next level. A technology core that enables fast and reliable connectivity is at the heart of the metaverse and all that it promises. The future of XR will be in shared experiences and shared reality. Without a network that can assure consistent connectivity and continuity of service, the metaverse and the immersive ecosystem it represents, will not be able to reach their full potential.



In the initial phases, there may be two main avenues of business opportunity for service providers when it comes to what the metaverse has to offer – enable or participate in the metaverse, or both. When it comes to enablement, 'metaverse-grade' is a prerequisite for connectivity, guaranteeing high throughput and low latency. For this reason, service providers will play a fundamental role in underpinning the metaverse through their 5G networks. There will also be a role for operators to offer dedicated network slices for metaverse-centric services that demand specific conditions around QoS and charging functionality, for example. There could be a scenario where an AR-dependent service requires a dedicated network slice that is tolerant of high throughput and a guaranteed level of QoS to deliver the right level of experience for each new metaverse application. This network slice would have specified analytics supporting predictive anomaly detection to ensure the end-user experience is not impacted by any network inconsistencies. Network slices can be spun up and spun down as and when new services are in demand.

Additionally, there is also the enablement of the e-commerce avenue. As explored in this eBook, there is a burgeoning market for selling products and experiences in the metaverse, which is set to grow over the coming years as the real potential of blockchain marketplaces and the trading of digital assets has prospected. Service providers have a window of opportunity to enable flexible monetisation for such transactions through a commerce platform or real-time charging solution. This type of enablement could be complemented by the support of a

centralised offer catalogue which would allow the promotion of specialised offers in real-time. Virtual services will require a guaranteed service delivery mechanism by way of the 5G network and a means through which to charge for the services consumed. Service providers may choose to offer customers the ability to pay for metaverse experiences and one-off bandwidth boost type offers through their monthly bill for convenience.

For those service providers who aim to go a step further and delve into the metaverse itself, there are also a variety of options to consider. Network brands may seek to leverage the metaverse as a new channel for sales and marketing, among other facilitations. This overview has explored a few examples of brands and industries already setting up their stall in sponsored virtual spaces where they can drive brand awareness and even provide customer care from the metaverse. As such, advertising new devices and showcasing in-store and online offers can provide additional hybrid benefits for retail turnover. Metaverse compatible bundles would allow service providers to package a subscription to a particular metaverse offer with the latest XR headset.

After all, the metaverse is all about ensuring a win-win situation!

Enabling technology ecosystems by bridging Network and IT

Networks are shifting in purpose and the value they create is being entirely reimagined. The role of the network has moved beyond selling connectivity to creating technology ecosystems. The metaverse represents one such ecosystem of experience services and e-commerce opportunity.

How quality ecosystems like this are delivered requires continuous dynamic control across network, IT and environments. The Amdocs solution suite provides the end-to-end capabilities to power and monetise the metaverse - from metaverse grade connectivity to enjoyable user engagement, from flexible charging to the ability to expose network value to strategic partners - Amdocs enables service providers to sit at the centre of these value-rich technology ecosystems.

Get ready to provide consumer business and enterprise customers with rich, innovative offerings by bundling connectivity with your own advanced digital services, and combining them with the best your partners have to offer.



Networks fixed | mobile (pre-5G) | 5G standalone | IoT



About Amdocs

Amdocs' purpose is to enrich lives and progress society, using creativity and technology to build a better connected world. Amdocs and its 26,000 employees partner with the leading players in the communications and media industry, enabling next-generation experiences in 85 countries. Our cloud-native, open and dynamic portfolio of digital solutions, platforms and services brings greater choice, faster time to market and flexibility, to better meet the evolving needs of our customers as they drive growth, transform and take their business to the cloud. Listed on the NASDAQ Global Select Market, Amdocs had revenue of \$4.2 billion in fiscal 2020.



About Openet

Openet, an Amdocs company, is a market leading software vendor enabling service providers to launch innovative offerings and drive revenues from connectivity. We have over 20 years' experience in providing our customers with a competitive edge in the markets they serve by building flexibility into everything we do. Our customers need the ability to rapidly adapt and respond to a changing market and this informs how we design our technology.

Working with world leading service providers, we are redefining how connectivity services can enhance outcomes for businesses and enrich the lives of consumers. As networks evolve with 5G, we look to ensure that the underlying technology is built to be agile and reliable, allowing our customers to effectively manage and monetise new services. This gives our customers the power to enter new markets, unlock new revenue streams and drive profitability.



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